Horse manure: the new secret weapon in cetacean conservation research

PARTLY DUE TO PHYSIOLOGICAL ADAPTATIONS that enable it to maintain a relatively high body temperature, the porbeagle shark is fast and highly active.

Although very few attacks on humans have been recorded, this agile predator normally grows to just over eight feet and 135kg (298lb); however, a 10ft/550lb creature was caught off Cornwall in 2012 (McGinnes, 2012).

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is impressed by work at the Natural History Museum in London and learns about the research currently being conducted to help us better understand the causes of cetacean deaths

Although these magnificent creatures are rapidly disappearing from the world's oceans, I would nevertheless be far more likely to flee from, rather than towards, a porbeagle shark, were I to encounter one whilst swimming in British waters. (Admittedly this is unlikely in the extreme, but perhaps one rare day it may be truly warm here – as an Australian I must keep hope alive).

Accordingly, I am deeply impressed by the courage of those who deliberately seek such close encounters. By capturing, releasing (and even – prior to budget cuts – tagging) such creatures, the Centre for Environment Fisheries and Aquaculture and members of the fishing industry have been able to compile accurate reports on our critically endangered porbeagle population and their migration patterns.

Minke whale exhibiting injuries consistent with a chronic entanglement [photo courtesy of Cetacean Strandings Investigation Programme and Scottish Agricultural College].

At a workshop hosted at the Natural History Museum (NHM) in London in summer 2015, Rebecca Lyal was one of those who had a chance to see one of the last funded dissections of a by-caught porbeagle shark.

Although since 2014 she has served as a cetacean stranding support officer within the Life Sciences Department at the NHM, Rebecca previously volunteered within the vertebrates division for over five years, and has a long-standing interest in fish.

Deeply engrossed

When I met her recently at the NHM, Rebecca was deeply engrossed in yet another fascinating project – namely, investigating the use of horse manure and sawdust to remove the soft tissues from the skull of a deceased pygmy sperm whale (*Kogia breviceps*).

Apparently, the bacteria so abundant within horse manure are excellent at removing the soft tissues, and even the oils that exude from the bones of this species. After just a few short months bathed in horse manure, the skull is revealed in all its glory!

The point, apparently, is to enable study of the skull. Despite ludicrous claims of "scientific research" underpinning Japan's commercial whaling programme, the number of large cetaceans studied to date has not been great, and so deceased, stranded cetaceans are of scientific interest. Indeed, Rebecca would like to be able to preserve entire cadavers.

The NHM freezer space, while substantial, is not unlimited and decomposing whales can make one quite unpopular with one's work colleagues. Think "odour of dog cadaver" multiplied about 30 times for a medium-sized whale. Hence the need to remove the soft tissues. I wondered how much horse manure the NHM needed on a monthly basis.

Such highly unusual tasks appear to be all in a day's work for an NHM cetacean stranding support officer. And, I suspected, for many of the 300 other life scientists Rebecca works with, given the amazing array of dinosaurs and other unusual animals all around her.

Rebecca works for the UK Cetacean Strandings Investigation Programme, which co-ordinates the investigation of whales, dolphins, porpoises, marine turtles and even basking sharks that dead strand around the UK. Around 400 to 600 cases are reported annually and Rebecca has collected over 20 such cetaceans for necropsy since 2014.

If animals are still alive at the time of stranding, the British Divers Marine Life Rescue volunteer network may attempt to refloat the animal, if survival chances appear reasonable.

Unfortunately, the damage and stress associated with a stranding can often so compromise a cetacean that euthanasia becomes necessary. Which, particularly in the case of larger animals, presents another unique set of challenges, such as vein accessibility, drug volumes, operator safety and cadaver disposal (AVMA, 2013).

When cetaceans die, beach-goers report sightings, and local councils or veterinary practices may be called on to recover the body away from the high-tide mark and, ideally, into a freezer/cold room until collection.

Causes of death

Apart from study of the species involved, the main purpose of collection and necropsy is to determine the likely cause of death. Organs are systematically examined and tissues sampled for virological, microbiological, histopathological, toxicological and other studies.

The most common causes of reported cetacean deaths between 1991 and 2010 were by-catch, infectious disease, live stranding, starvation and bottlenose dolphin attack (Deaville and Jepson, nd). The pattern from 2010 to 2014 has been similar. Around 50% of UK reports originate from England, and the majority concern harbour porpoises (*Phocoena phocoena*).

Sadly, far too many cetaceans are unintentionally entangled in fishing gear. Survival depends on species, the degree of entanglement, and the presence or absence of any cetacean excluder mechanisms.

Rebecca Lyal with her pygmy sperm whale skull, sans horse manure.

Many others starve, as we continue to rapidly deplete the ocean's fisheries. Gear that is lost overboard or discarded by fishing vessels still causes entanglement (known as "ghost fishing"), continuing to kill cetaceans and fish alike.

It was inspiring to meet Rebecca and learn about the fascinating research she conducts to help us better understand the causes of cetacean deaths. It was, however, depressing to learn once more of the grave consequences for the other remarkable creatures we share our world with, that result from our seemingly insatiable desire for overconsumption – in this case, of seafood.

Acknowledgement

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